

100V N+N-Channel Enhancement Mode MOSFET

Description

The AP40H10NF uses advanced **APM-SGT II** technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = 100V$ $I_D = 40A$

$R_{DS(ON)} < 20m\Omega$ @ $V_{GS}=10V$ (Type: 14m Ω)

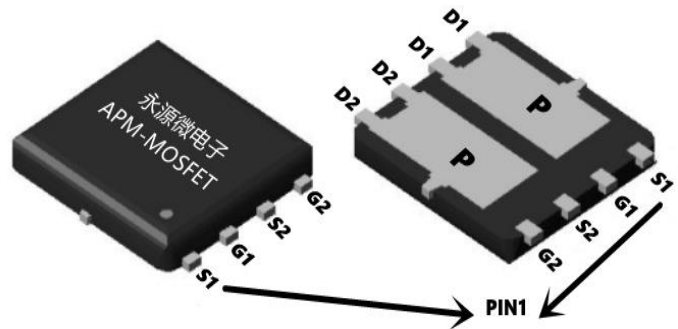
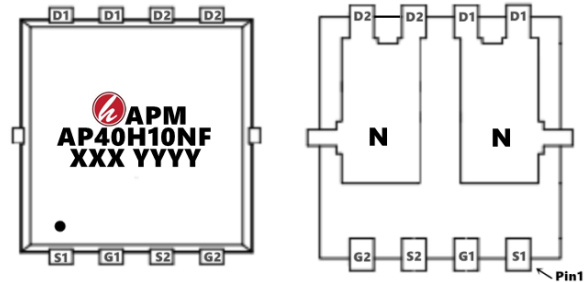
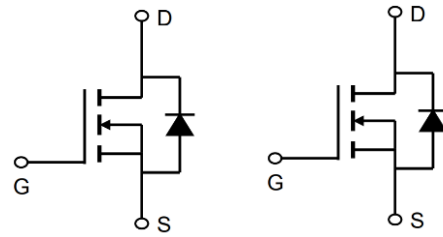
Application

Consumer electronic power supply

Motor control

Synchronous-rectification

Isolated DC



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP40H10NF	PDFN5*6-8L	AP40H10NF XXX YYYY	5000

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain source voltage	100	V
V_{GS}	Gate source voltage	± 20	V
I_D	Continuous drain current ¹⁾ , $T_C=25^\circ\text{C}$	40	A
I_D , pulse	Pulsed drain current ²⁾ , $T_C=25^\circ\text{C}$	120	A
P_D	Power dissipation ³⁾ , $T_C=25^\circ\text{C}$	71	W
EAS	Single pulsed avalanche energy ⁵⁾	57	mJ
T_{stg} , T_J	Operation and storage temperature	-55 to 150	$^\circ\text{C}$
$R_{\theta JC}$	Thermal resistance, junction-case	1.76	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal resistance, junction-ambient ⁴⁾	25	$^\circ\text{C/W}$

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Electrical Characteristics (T_c=25°C unless otherwise noted)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BVDSS	Drain-source breakdown voltage	V _{GS} =0 V, I _D =250 μA	100	107		V
VGS(th)	Gate threshold voltage	V _{DS} =V _{GS} , I _D =250 μA	1.2	1.5	2.5	V
RDS(ON)	Drain-source on-state resistance	V _{GS} =10 V, I _D =10 A		14	20	mΩ
RDS(ON)	Drain-source on-state resistance	V _{GS} =4.5 V, I _D =7 A		18	25	mΩ
IGSS	Gate-source leakage current	V _{GS} =±20 V			±100	nA
IDSS	Drain-source leakage current	V _{DS} =100 V, V _{GS} =0 V			1	uA
Ciss	Input capacitance	V _{GS} =0 V, V _{DS} =50 V, f=100 kHz		1003.9		pF
Coss	Output capacitance			185.4		pF
Crss	Reverse transfer capacitance			9.8		pF
td(on)	Turn-on delay time	V _{GS} =10 V, V _{DS} =50 V, R _G =10 Ω, I _D =5 A		16.6		ns
t _r	Rise time			3.8		ns
td(off)	Turn-off delay time			75.5		ns
t _f	Fall time			46		ns
Q _g	Total gate charge	I _D =5 A, V _{DS} =50V, V _{GS} =10V		16.2		nc
Q _{gs}	Gate-source charge			2.8		nc
Q _{gd}	Gate-drain charge			4.1		nc
Vplateau	Gate plateau voltage			3		V
I _s	Diode forward current	V _{GS} <V _{th}		30		A
ISP	Pulsed source current			90		A
trr	Reverse recovery time	I _S =1A, di/dt=100 A/μs	49			ns
Q _{rr}	Reverse recovery charge		61.8			nc
Irrm	Peak reverse recovery current		2.4			A

Note :

- 1、 Calculated continuous current based on maximum allowable junction temperature.
- 2、 Repetitive rating; pulse width limited by max. junction temperature.
- 3、 Pd is based on max. junction temperature, using junction-case thermal resistance.
- 4、 The value of R_{θja} is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.
- 5、 V_{DD}=50 V, R_G=25 Ω, L=0.3 mH, starting T_J=25 °C.

Typical Characteristics

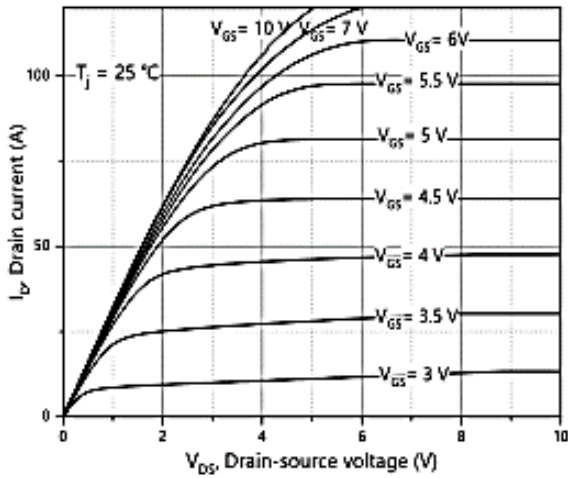


Figure 1, Typ. output characteristics

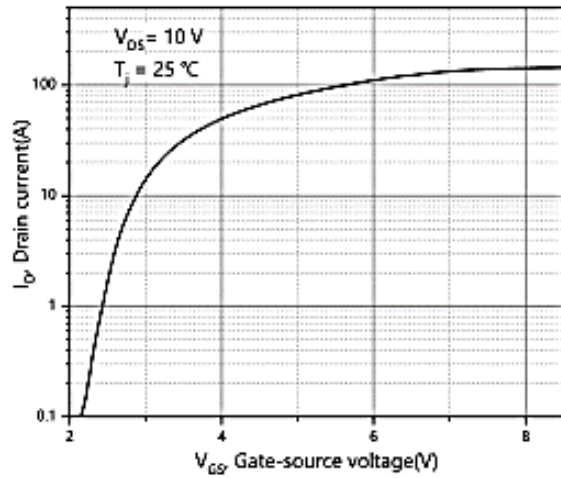


Figure 2, Typ. transfer characteristics

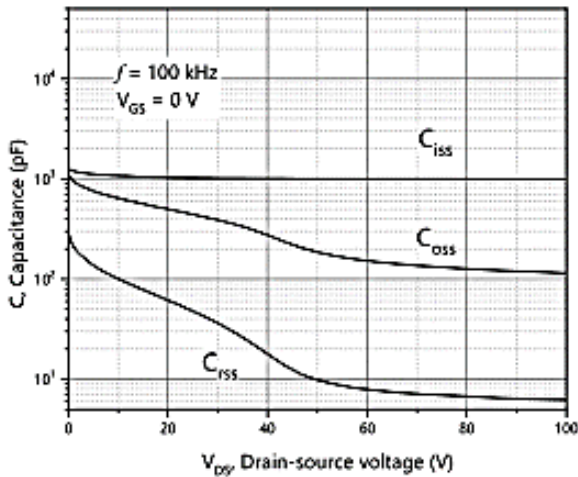


Figure 3, Typ. capacitances

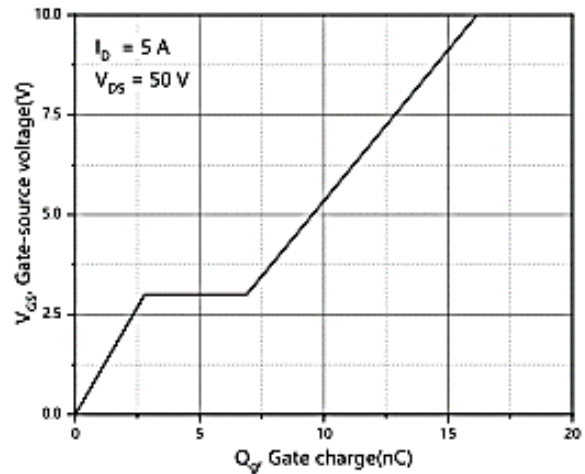


Figure 4, Typ. gate charge

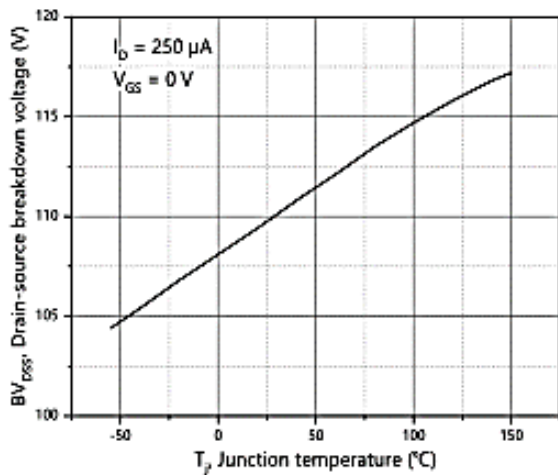


Figure 5, Drain-source breakdown voltage

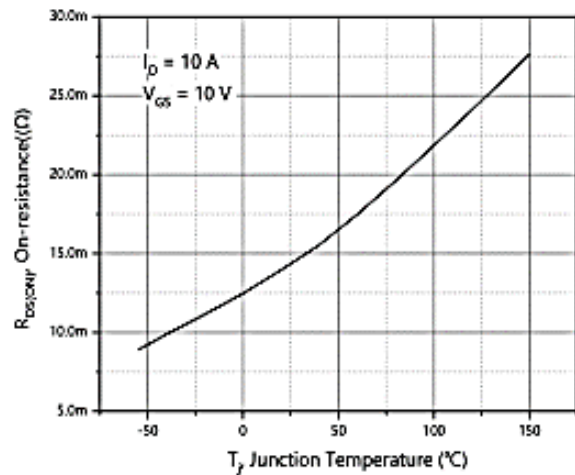


Figure 6, Drain-source on-state resistance

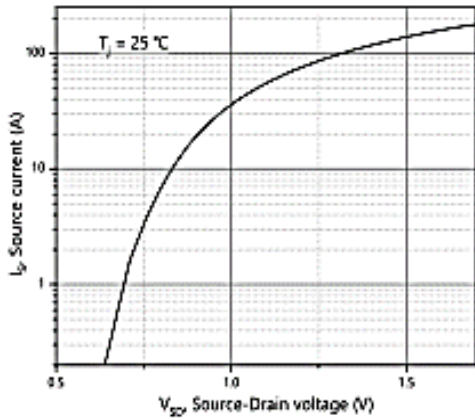


Figure 7, Forward characteristic of body diode

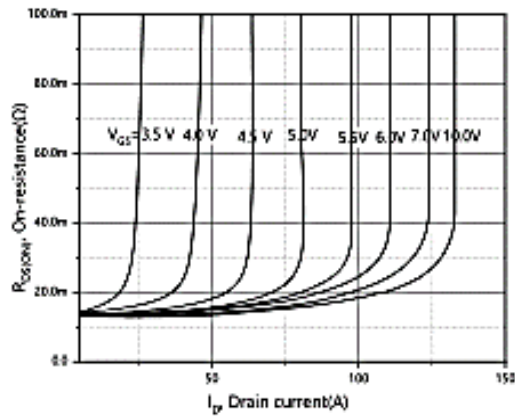


Figure 8, Drain-source on-state resistance

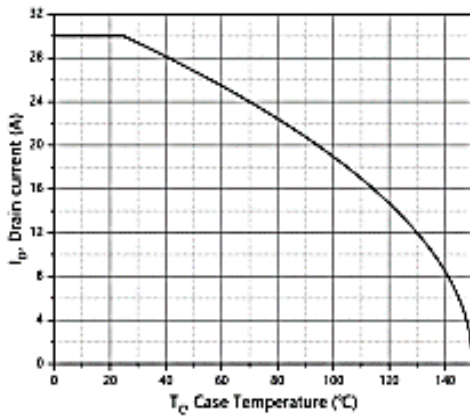


Figure 9, Drain current

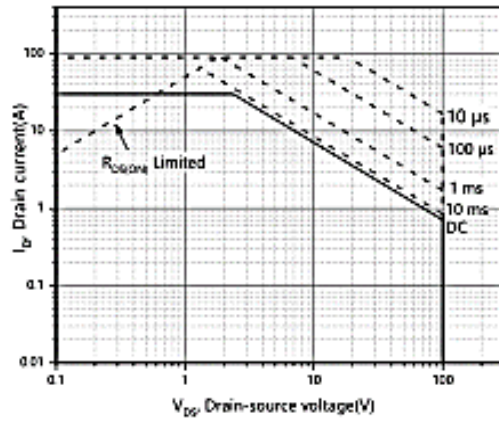


Figure 10, Safe operation area $T_C=25\text{ }^\circ\text{C}$

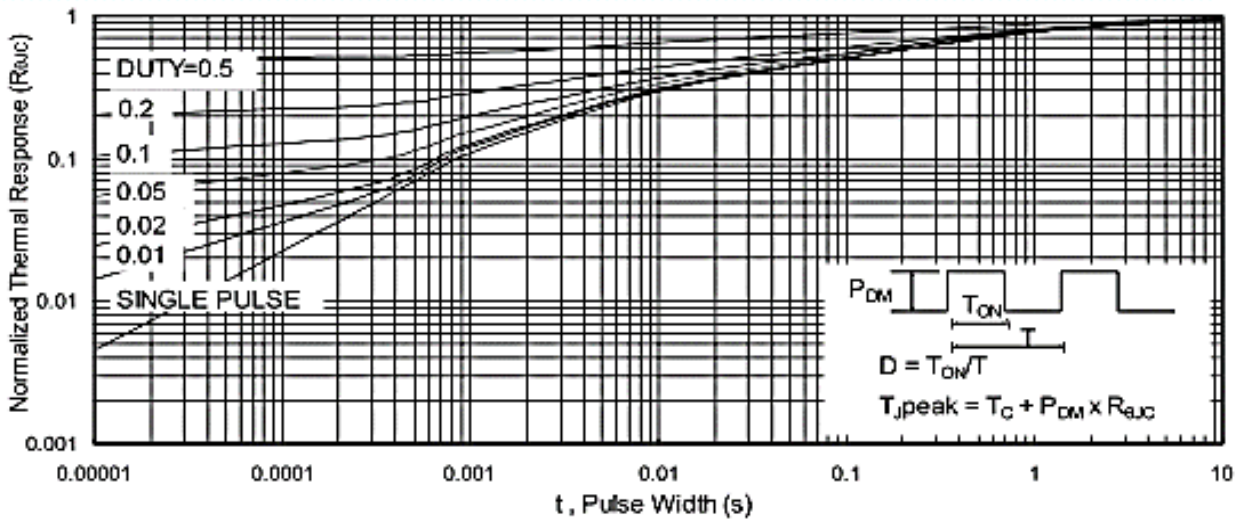
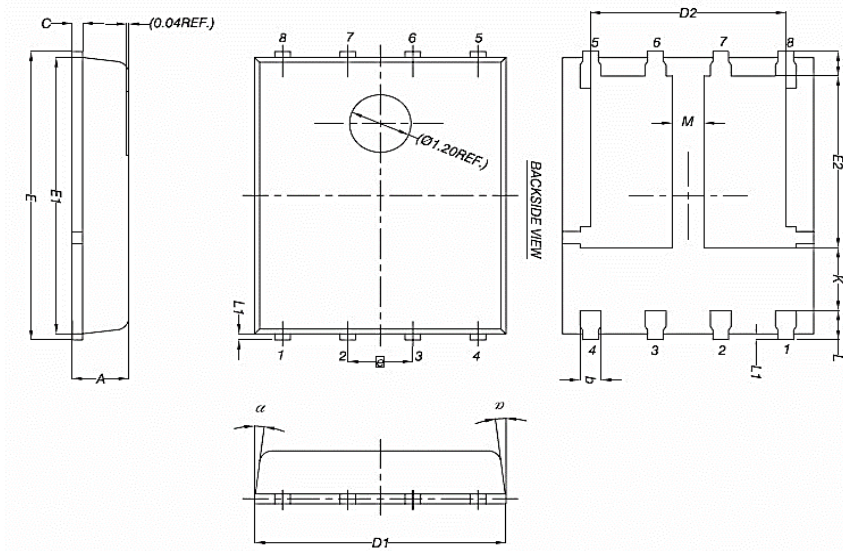


Figure 11, Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-DFN5*6-8L-JQ Double



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.90	1.00	1.10
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	3.30	3.45
E2	3.38	3.05	3.20
e	1.27BSC		
H	0.41	0.51	0.61
K	1.10	--	--
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
M	0.50	--	--
a	0°	--	12°

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Edition	Date	Change
Rve1.0	2021/9/10	Initial release

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